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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,818	11/12/2003	Mark R. Fernald	CC-0675	8840

7590 11/09/2005
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EXAMINER

WASHBURN, DOUGLAS N

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

N.A

Office Action Summary	Application No. 10/712,818	Applicant(s) FERNALD ET AL.	
	Examiner Douglas N. Washburn	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,8,10,11,15-17,23-28,32 and 33 is/are rejected.
- 7) ☒ Claim(s) 2, 5-7, 12-14, 18-22, 29-31 and 34-37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1 The information disclosure statements filed 6 September 2005 and
12 September 2005 fail to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. They have been placed in the application file, but the information referred to therein has not been considered.

Claim Objections

2 Claims 26, 29 and 34 are objected to because of the following informalities:

 Claim 26 recites, in part, "A strain sensor for clamping onto the outer surface of the pipe to provide a respective strain signal ..." wherein the phrase "the pipe" lacks antecedance.

 Examiner suggests "A strain sensor for clamping onto the outer surface of a pipe to provide a respective strain signal..."

 Claim 29 recites, in part, "The sensor of claim 26, wherein the strain sensor includes an attachment device for securing the ends of the strap of the strain sensor to clamp the strain sensor onto the pipe." wherein the phrase "the pipe" lacks antecedance.

 Examiner suggests "The sensor of claim 26, wherein the strain sensor includes an attachment device for securing the ends of the strap of the strain sensor to clamp the strain sensor onto a pipe."

 Claim 34 recites, in part, " The sensor of claim 26, wherein the piezoelectric film material extends around a substantial portion of the circumference of the pipe." wherein the phrase "the pipe" lacks antecedance.

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Examiner suggests " The sensor of claim 26, wherein the piezoelectric film material extends around a substantial portion of the circumference of a pipe."

Correction is required.

Claim Rejections - 35 USC § 102

3 The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26-28, 32 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by French (US 4,883,271) (Hereafter referred to as French).

French teaches:

A strap (figure 1, element 22; figure 3, element 22'; figure 6, element 22'') in regard to claims 1 and 26;

A piezoelectric film material having a pair of conductors disposed on opposing surfaces thereof (column 6, lines 62-66) wherein the piezoelectric film material is attached to the strap (column 4, lines 40-42) in regard to claims 1 and 26;

A piezoelectric film material is attached to the outer surface of the strap and/or the inner surface of the strap (column 4, lines 40-42) in regard to claims 3 and 27;

A strap is a metallic material (column 6, lines 62-66; column 7, lines 4-7) in regard to claims 4 and 28;

A piezoelectric film material includes at least one of polyvinylchlorine fluoride (PDVF) (column 6, lines 62-66), polymer film and flexible PZT in regard to claims 8 and 32;

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And each of the conductors (of a sensor) is a coating of silver ink (column 7, lines 4-7) in regard to claims 10 and 33.

Claim Rejections - 35 USC § 103

4 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, 8, 10, 11, 15-17 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gysling et al. (US 6,354,147) (Hereafter referred to as Gysling 4147) in view of French.

Gysling 4147 teaches:

At least two strain (pressure) sensors clamped onto the outer surface of a pipe at different axial locations along the pipe, each of the pressure sensors providing a respective pressure signal indicative of a pressure disturbance within the pipe at a corresponding axial position (column 2, lines 1-11; column 15, lines 60-65; figures 1, 19, 29 and 30) in regard to claim 1;

A strap (strapping) (column 19, lines 17-21) in regard to claim 1;

A piezoelectric film sensor (piezoelectric strain gauge) attached to a strap (column 19, lines 30-33) in regard to claim 1;

A signal processor (signal processor), responsive to said pressure signals, which provides a signal indicative of at least one parameter of a process flow flowing within a pipe (column 2, lines 9-11) in regard to claim 1;

A piezoelectric film sensor is attached to the outer surface of a strap and/or the inner surface of the strap (column 19, lines 12-17) in regard to claim in regard to claim 3;

A strap is a metallic material (column 19, lines 17-21) in regard to claim 4;

A piezoelectric film extends around a substantial portion of the circumference of a pipe (column 17, lines 3-6) in regard to claim 11;

Pressure signals are indication of acoustic pressures propagating within a pipe (column 2, lines 5-9) in regard to claim 15;

A parameter of a fluid is one of steam quality or "wetness", vapor/mass ratio, liquid/solid ratio, volumetric flow rate, mass flow rate, size of suspended particles, density, gas volume fraction, and enthalpy of a flow (column 2, lines 66 et seq; column 3, lines 1-9) in regard to claim 16;

A signal processor determines the slope of an acoustic ridge in the k-w plane to determine a parameter of the process flow flowing in the pipe (column 23, lines 5-23) in regard to claim 17;

Each sensor measures an acoustic pressure and provides a signal indicative of an acoustic noise within a pipe (column 8, lines 49-53) in regard to claim 23;

At least three pressure sensors (column 5, lines 50-52; figure 1, elements 14, 16 and 18) in regard to claim 24;

And strain sensors include pressure sensors (column 15, lines 60-65) in regard to claim 25.

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Gysling is silent regarding:

A piezoelectric film material having a pair of conductors disposed on opposing surfaces thereof (column 6, lines 62-66) wherein the piezoelectric film material is attached to the strap (column 4, lines 40-42) in regard to claim 1;

A piezoelectric film material includes at least one of polyvinylchlorine fluoride (PDVF) (column 6, lines 62-66), polymer film and flexible PZT in regard to claim 8;

And each of the conductors (of a sensor) is a coating of silver ink (column 7, lines 4-7) in regard to claim 10.

French teaches:

A strap (figure 1, element 22; figure 3, element 22'; figure 6, element 22'') in regard to claims 1 and 26;

A piezoelectric film material having a pair of conductors disposed on opposing surfaces thereof (column 6, lines 62-66) wherein the piezoelectric film material is attached to the strap (column 4, lines 40-42) in regard to claims 1 and 26;

A piezoelectric film material is attached to the outer surface of the strap and/or the inner surface of the strap (column 4, lines 40-42) in regard to claims 3 and 27;

A strap is a metallic material (column 6, lines 62-66; column 7, lines 4-7) in regard to claims 4 and 28;

A piezoelectric film material includes at least one of polyvinylchlorine fluoride (PDVF) (column 6, lines 62-66), polymer film and flexible PZT in regard to claims 8 and 32;

And each of the conductors (of a sensor) is a coating of silver ink (column 7, lines 4-7) in regard to claims 10 and 33.

Regarding Claims 1, 3, 4, 8, 10, 11, 15-17 and 23-25, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Gysling of at least two strain sensors clamped onto the outer surface of a pipe at different axial locations along the pipe, each of the pressure sensors providing a respective pressure signal indicative of a pressure disturbance within the pipe at a corresponding axial position with the teaching of French of a piezoelectric film material having a pair of conductors disposed on opposing surfaces and attached to the strap because piezoelectric film material having a pair of conductors disposed on opposing surfaces and attached to the strap would have been a highly sensitive sensors for measuring unsteady pressures within a pipe.

Regarding claim 8, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Gysling 4147 of a piezoelectric film sensor attached to a strap with the teaching of French of a piezoelectric film sensor includes at least one of polyvinylchlorine fluoride (PDVF), polymer film and flexible PZT because would have been highly sensitive sensors for measuring unsteady pressures within a pipe.

Regarding claim 10, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Gysling 4147 of a piezoelectric film sensor with the teaching of French of each of the pair of conductors is a coating of silver ink because a piezoelectric film sensor with a pair of conductors is a coating of silver ink would have been more reliable and provided more accurate measurement.

Response to Amendment

5 Applicant amendment overcomes objection to claims 10 and 12-14 and the objection is withdrawn.

Applicant amendment overcomes objection to the specification and the objection is withdrawn.

Applicant amendment overcomes §102(b) rejection of claims 1, 3-7, 15-17, 23 and 24 and the rejection is withdrawn.

Applicant amendment overcomes §103(a) rejection of claims 2, 8-11 and 18-22 and the rejection is withdrawn.

Allowable Subject Matter

6 Claims 2, 5-7, 12-14, 18-22, 29-31 and 34-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 12-14 reasons indicated as allowable previously presented in action mailed 4 March 2005.

The following is an examiner's statement of reasons for indicating allowance:

Claim 2 recites, in part, "process flow is one of a single phase fluid and a multi-phase mixture". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 5 recites, in part, "at least one of the strain sensors include an attachment device for securing the ends of the strap of the strain sensor to clamp the strain sensor onto a pipe". This feature in combination with the remaining claimed structure avoids the prior art of record.

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Claim 6 recites, in part, "ends of at least one of the strain sensors are removably attached together to enable the removable and reattachment to a pipe". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 7 recites, in part, "ends of at least one of the strain sensors are permanently attached together". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 18 recites, in part, "strain signals are indication of vortical disturbances within the fluid flow". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 19 recites, in part, "the parameter of the fluid is one of velocity of the process flow and the volumetric flow of the process fluid". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 20 recites, in part, "the signal processor determines the slope of a convective ridge in the k - ω plane to determine the velocity of the fluid flowing in the pipe". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 21 recites, in part, "the signal processor determines the volumetric flow rate of the fluid flowing in the pipe in response to the velocity of the fluid". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 22 recites, in part, "the signal processor generates a flow velocity signal indicative of the velocity of the fluid flowing within the pipe by cross-correlating the strain signals". This feature in combination with the remaining claimed structure avoids the prior art of record.

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Claim 29 recites, in part, "a strain sensor includes an attachment device for securing the ends of the strap of the strain sensor to clamp the strain sensor onto the pipe". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 30 recites, in part, "ends of the strain sensor are removably attached together to enable the removable and reattachment to a pipe". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 31 recites, in part, "ends of a strain sensor are permanently attached together". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 34 recites, in part, "A piezoelectric film material extends around a substantial portion of the circumference of the pipe". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 35 recites, in part, "piezoelectric film has a thickness greater than 8 mm". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 36 recites, in part, "piezoelectric film has a thickness between 8 mm and 120 mm". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 37 recites, in part, "includes an electrical insulator between the piezoelectric film and the strap". This feature in combination with the remaining claimed structure avoids the prior art of record.

It is these limitations, which are not found, taught or suggested in the prior art of record, and are recited in the claimed combination that makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

7 Applicant's arguments with respect to claims 1-8, 10, 11 and 15-24 have been considered but are moot in view of the new grounds of rejection.

Conclusion

8 Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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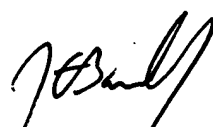
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas N. Washburn whose telephone number is (571) 272-2284. The examiner can normally be reached on Monday through Thursday 6:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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DNW


John Barlow
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